

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 July 2003 (31.07.2003)

PCT

(10) International Publication Number
WO 2003/062264 A3

(51) International Patent Classification⁷: **A61K 48/00**,
G01N 33/53, C12N 15/00, 1/20

(21) International Application Number:
PCT/US2003/001426

(22) International Filing Date: 16 January 2003 (16.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/349,893 16 January 2002 (16.01.2002) US

(71) Applicant (for all designated States except US): **RE-
GENTS OF THE UNIVERSITY OF CALIFORNIA**
[US/US]; 1111 Franklin Street, Oakland, CA 94607-5200
(US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **SPEAR, A., Matthew**
[US/US]; 10680 Vista Del Agua, San Diego, CA 92121
(US).

(74) Agents: **CARROLL, Peter, G. et al.**; Medlen & Carroll,
LLP, Suite 350, 101 Howard Street, San Francisco, CA
94105 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SC, SD, SE, SG,
SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VC, VN,
YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI,
SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:
5 February 2004

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: **FUNCTIONAL LIGAND DISPLAY**

(57) Abstract: The present invention relates to methods involving the selection of peptides from complex displayed libraries to induce or detect signal transduction pathway activation. In one embodiment, the present invention provides methods for the selection of peptides capable of binding a viable cell and subsequently triggering or detecting programmed cell death (e.g., apoptosis). The present invention also provides compositions comprising the selected peptides suitable for medicinal and research use.



WO 2003/062264 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/01426

A. CLASSIFICATION OF SUBJECT MATTER

IPC() : A61K 48/00; G01N 33/53; C12N 15/00, 1/20
US CL : 424/93.6; 435/7.2, 69.1, 252.3, 320.1, 325, DIG 2-4

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 424/93.6; 435/7.2, 69.1, 252.3, 320.1, 325, DIG 2-4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/0055585 A1 (CANCE et al), 27 December 2001 (27.12.2001), see entire document, especially paragraphs 0043, 0044, 0077, 0081 and claims 18 & 22.	1-3, 6, 7, 9-11, 14, 15
---		-----
Y		4, 5, 8, 12, 13, 16
Y	MOORE et al. Simultaneous Measurement of Cell Cycle and Apoptotic Cell Death. Methods in Cell Biology. 1998, Vol. 57, pp. 265-278, see entire document, especially Abstract and pages 272-275.	1-16
Y	CHOWDHURY et al. Analysis of Cloned Fvs from a Phage Display Library Indicated that DNA Immunization can Mimic Antibody Response Generated by Cell Immunizations. J. Immuno. Meth. 1999, Vol. 231, pp. 83-91, see entire document.	1-16
Y	WINTHROP et al. Development of a Hyperimmune Anti-MUC-1 Single Chain Antibody Fragments Phage Display Library for Targeting Breast Cancer. Clin. Cancer Res. October 1999, Vol. 5, pp. 3088s-3094s, see entire document.	1-16
Y	US 5,824,520 A (MULLIGAN-KEHOE) 20 October 1998 (20.10.1998), see entire document, especially claims.	1-16



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

07 April 2003 (07.04.2003)

Date of mailing of the international search report

23 SEP 2003

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Maurie G. Baker

Telephone No. 703-308-0196

INTERNATIONAL SEARCH REPORT

PCT/US03/01426

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SPEAR et al. Isolation, Characterization and Recovery of Small Peptide Phage Display Epitopes Selected against Viable Malignant Glioma Cells. Cancer Gene Therapy. 2001, Vol. 8, No. 7, pp. 506-511, see entire document.	1-16
Y	US 6,287,874 B1 (HEFTI) 11 September 2001 (11.09.2001), see entire document, especially claims.	1-16

Continuation of B. FIELDS SEARCHED Item 3:

WEST, STN (BIOSIS, EMBASE, CAPlus, SciSearch, Medline)

Terms: phage, display, library, cancer, cell, leukemia, indicator, screen?, fluoresc?, annexin v